We claim:

1. A composition for forming an insulating layer, the composition comprising:

a mixture comprising inorganic nanoparticles present in an amount of 5 to 95 percent by weight of the mixture dispersed in polymethylsilsesquioxane present in an amount of 5 to 95 percent by weight of the mixture;

a solvent; and

one or more optional additives,

wherein the composition has a viscosity suitable for applying the composition using a digital printing technique.

2. The composition of claim 1, wherein the composition has a viscosity of 1 to 100,000 centipoise measured using continuous stress sweep, over shear rates of 1 s^{-1} to 1000 s^{-1}.

3. The composition of claim 1, wherein the composition has a viscosity suitable for ink jet printing.

4. The composition of claim 3, wherein the composition has a viscosity of 1 to 40 centipoise measured using continuous stress sweep, over shear rates of 1 s^{-1} to 1000 s^{-1}.

5. The composition of claim 1, wherein the nanoparticles comprise one or more of silica, zirconia, and alumina particles.

6. The composition of claim 1, wherein the inorganic nanoparticles are surface modified.

7. The composition of claim 6, wherein the surface modifier comprises a carboxylic acid, a carboxylic acid derivative, a silane, or mixtures thereof.

8. The composition of claim 7, wherein the carboxylic acid derivatives comprise hexanoic acid or 2[-2-(2-methoxyethoxy)ethoxy] acetic acid.

9. The composition of claim 7, wherein the silanes comprise methyltriethoxysilane, methyltrimethoxysilane, isobutyltriethoxysilane, isobutyltrimethoxysilane, isooctyltriethoxysilane, isooctyltrimethoxysilane, or mixtures thereof.

10. The composition of claim 1, wherein the nanoparticles have an average size of 1 to 500 nanometers.

11. The composition of claim 1, wherein the nanoparticles have an average size of 5 to 125 nanometers.

12. The composition of claim 1, wherein the one or more optional additives are present in an amount of 0 to 60 percent by weight of the composition after evaporation of substantially all the solvent.

13. The composition of claim 1, wherein the one or more optional additives comprise an adhesion promoter.

14. The composition of claim 13, wherein the adhesion promoter comprises polyethyloxazoline.

15. The composition of claim 13, wherein the adhesion promoter is present in an amount of 0 to 5 percent by weight of the composition after evaporation of substantially all the solvent.

16. The composition of claim 1, wherein the one or more optional additives comprise one or more tetraalkoxysilanes and alkyltrialkoxysilanes.

17. The composition of claim 16, wherein the alkoxysilanes are selected from the group consisting essentially of tetraethoxysilane, tetramethoxysilane, methytriethoxysilane, and methyltrimethoxysilane.

18. The composition of claim 16, wherein the one or more tetraalkoxysilanes and alkyltrialkoxysilanes are present in an amount of 0 to 50 percent by weight of the composition after evaporation of substantially all the solvent.

19. The composition of claim 1, wherein the one or more optional additives comprise a flexibilizer.

20. The composition of claim 19, wherein the flexibilizer comprises one or more of dialkyldialkoxysilanes and trialkylmonoalkoxysilanes.

21. The composition of claim 20, wherein the one or more dialkyldialkoxysilanes and trialkylmonoalkoxysilanes are selected from the group consisting essentially of dimethyldiethoxysilane, dimethyldimethoxysilane, trimethylethoxysilane, and trimethylmethoxysilane.

22. The composition of claim 19, wherein the flexibilizer is present in an amount of 0 to 40 percent by weight of the composition after evaporation of substantially all the solvent.

23. The composition of claim 1, wherein the one or more optional additives comprise an organic acid.

24. The composition of claim 23, wherein the organic acid comprises acetic acid, methoxyethoxyacetic acid, hexanoic acid, or mixtures thereof.

25. The composition of claim 23, wherein the organic acid is present in an amount of 0 to 3 percent by weight of the composition after evaporation of substantially all the solvent.

26. The composition of claim 1, wherein the solvent comprises an alcohol, a ketone, an ether, an acetate, or mixtures thereof.

27. A method of printing an insulating layer comprising:

providing a composition for forming an insulating layer, the composition comprising (i) a mixture comprising surface modified inorganic nanoparticles present in an amount of 5 to 95 percent by weight of the mixture dispersed in polymethylsilsesquioxane present in an amount of 5 to 95 percent by weight of the mixture, (ii) a solvent, and (iii) one or more optional additives; and

printing the composition onto a substrate using a digital printing technique.

28. The method of claim 27, wherein the digital printing technique comprises ink jet printing.

29. The method of claim 27, wherein the digital printing technique comprises aerosol printing or syringe printing.

30. The method of claim 27, further comprising the step of drying the composition after the printing step to substantially remove the solvent.

31. The method of claim 27, further comprising incorporating the substrate into a touch activated user input device.

32. A touch activated user input device comprising:

a substrate; and

an insulating layer deposited onto at least a portion of the substrate, the insulating layer comprising polyorganosilsesquioxane.

33. The touch activated user input device of claim 32, wherein the insulating layer further comprises inorganic nanoparticles.

34. The touch activated user input device of claim 32, wherein the substrate comprises glass or plastic.

35. The touch activated user input device of claim 32, wherein the plastic substrate comprises polyethylene terephthalate.

36. The touch activated user input device of claim 32, wherein the substrate comprises conductive traces on a non-conductive surface.

37. The touch activated user input device of claim 32, wherein the insulating layer is deposited as a protective coat over conductive traces.

38. The touch activated user input device of claim 32, wherein the insulating layer is deposited as a protective coat over a linearization layer.

39. The touch activated user input device of claim 32, wherein the substrate has a primary surface, and wherein the insulating layer is deposited as a hard coat over a majority of the primary surface.

40. The touch activated user input device of claim 36, wherein the conductive traces comprise a conductive polymer.

41. The touch activated user input device of claim 36, wherein the insulating layer at least partially covers the conductive traces and wherein the insulating composition is substantially free of pinholes.

42. The touch activated user input device of claim 32, wherein the insulating layer is a protective coating over a resistive layer disposed in an active area of the touch device for carrying a signal indicative of a touch input.

43. The touch activated user input device of claim 32, wherein the insulating layer comprises at least 10 percent by weight polymethylsilsesquioxane.

44. The touch activated user input device of claim 32, wherein the insulating layer comprises from 10 to 95 percent by weight polymethylsilsesquioxane and from 5 to 90 percent by weight inorganic nanoparticles.

45. The touch activated user input device of claim 32, wherein the insulating layer is substantially stable at a temperature of 500 °C.

46. A method for making a touch activated user input device comprising:

providing a substrate;

printing a composition containing polyorganosilsesquioxane onto the substrate;

curing the composition containing polyorganosilsesquioxane at a temperature below 150 °C to form an insulating layer.

47. The method of claim 46, wherein the step of printing comprises ink jet printing.

48. The method of claim 46, wherein the step of printing comprises screen printing.

49. The method of claim 46, wherein the insulating layer is substantially stable at a temperature of 500 °C.

50. The method of claim 46, wherein the composition containing polymethylsilsesquioxane further comprises inorganic nanoparticles.

51. The method of claim 50, wherein the inorganic nanoparticles comprise one or more of silica, zirconia, and alumina particles.

52. The method of claim 50, wherein the nanoparticles are surface-modified.

53. The method of claim 46, wherein the composition containing polymethylsilsesquioxane comprises at least 10 percent by weight polymethylsilsesquioxane.

54. The method of claim 46, wherein after the curing step the composition comprises from 10 to 95 percent by weight polymethylsilsesquioxane and from 5 to 90 percent by weight inorganic nanoparticles.